REMARKS

Claims 1, 2, 8, 11, 12, 14, 16, and 17 were rejected for lack of particularity. Applicant requests reconsideration. The claims have been accordingly amended. Claim 1 was rejected as unpatentable over Brendel in view of Gifford. Claims 2-6, 8, 9, 11, 12, and 14-17 were rejected as unpatentable over Brendel in view of Gifford in view of Isoyama. Claims 7, 10, and 13 were rejected as unpatentable over Brendel in view of Gifford in view of Hendren. Applicant requests reconsideration.

Independent claims 1, 8, and 12 all include associating an originating IPA and the originating URL identifier. Claims 8 and 12 further includes associating a distance metric. The present invention associates the originating IPA with the originating URL as a routing item that is broadcast from a proximal cache to a distal cache. The invention enables the creation and use of a network of caches for retrieving web content data from a local cache. The distal cache can transmit a URL request directly to the associated IPA without a DNS lookup. The distal cache can use the routing item to create a forwarding routing table with which to relay URL requests within the network of web caches. Hence, the distal cache need not perform DNS lookups but can find the web content data on proximal caches for efficient transfer of web content data rather than retrieving directly from far distal and originating web servers. By including the distance metric, the distal cache can also determine the minimum hops through

intermediate web caches to nearest web cache having the sought after web content data for even more efficient access.

Hence, the present invention associates originating URLs with originating IPAs with an optional distance metric for solving the problem of web caching. A destination cache can issue an originating URL at an originating IPA that is a local web cache rather than a remote web server. The originating IPA can be a proximal IPA of a proximal cache storing the sought after web content data as if the proximal cache were the originating URL web server. The originating URL identifies the web content data and includes the web server name originally storing the web content data. The originating IPA is the IPA of a web cache or web server storing the web content data. The originating IPA can be any host computer IPA storing the sought after web content data, such as the IPA of a proximal cache also storing the web content data. A distal cache can issue an originating URL at a proximal and associated originating IPA that may also be a minimum number of hops from a web cache at a requesting IPA. As such, the present invention associates the originating IPA and originating URL for purposes of broadcasting routing items of an effective forwarding-routing table. The routing items can then be accumulated in another cache for efficient routing of URL requests. The broadcasting of the routing item for associating the IPA and URL to distal recipients enables the recipients to route URL requests that can be served from alternative IPA locations that might also be a minimum number of hops from the requester IPA.

Independent claims 1 and 12 were rejected over Brendel and Gifford and independent claim 8 was rejected over Brendel and Gifford and Isoyama. These cited references do not teach associating an originating IPA and an originating URL as a routing item, do not teach the broadcasting of routing items, and do not teach using the routing items in a forwarding routing table for accessing alternative web caches and servers alternatively storing the sought after web content data.

Brendel has a load balancer that is a front-end interface to a plurality of web servers all storing the web content data. The balancer and plurality of web servers emulate a single server. Each of the servers may store part of the web content data associated with URL resources. The balancer and web servers collectively function as a single web server at a single originating URL having a single originating IPA. The balancer dispatches the URL requests to the web servers having the web content data specified by the URL resource. The URL resource is the "/" component of the web content data. Hence, the web content data may be shared and divided among the web servers for load balancing.

The browsers issue originating URLs to domain name services (DNS) that obtain the originating IPA, as is very well known. The browsers issue URL requests to the IPA returned by DNS. The load balancer receives all of the originating URL requests from the respective browsers. The URL requests include the originating IPA of the load balancer, the originating URL, including the resources stored by the web servers, and the destination IPAs of the

browsers. The load balancer then searches a directory that associates the originating URL resources with differing web servers storing the web content data, with originating IPAs. By routing the URL requests to the web servers and by inserting differing originating IPAs, the collective data traffic is distributed among the web servers. That is, the load balancer distributes the URL requests among the plurality of web servers, all of which send the web content data back to the respective requesting browser. As such, the load balancer has a directory for associating originating URL resources with originating IPAs for load balancing. Brendel effectively bundles together the load balancer and a plurality of web servers that collectively function as a single web server. Hence, the balancer and the plurality of web servers collectively function as a web server.

Particularly, the load balancer is not a proximal cache, nor a destination cache, but a front-end load distributor to a single IPA. The load balancer does not broadcast routing items for use in a routing table. The load balancer does not generate a destination IPA. The load balancer does not transmit the routing item to a destination cache. Brendel does not teach generating an IPA (col. 2, lines 27-35), but rather teaches DNS look up, as is well known. Brendel does not teach generating a destination IPA for a destination cache. Brendel does not teach the use of a destination cache. Brendel does not teach transmitting a routing item from a proximal cache to a destination cache, as Brendel does not seek to develop a web cache network, but rather, a single load balanced web server.

Brendel associates an originating URL resource with originating IPAs in a directory for relaying a URL resource request to one of the attached web servers. In Brendel, there is no concept of proximal caching, distal caching, or routing item broadcasting for purposes for generating or maintaining forwarding tables. Brendel in no way supports network caching using forwarding tables. Brendel association of originating IPAs with originating URLs is solely for the purpose load distribution amongst of a group of web servers functioning as one server.

Gifford teaches a replica advertisement that contains a replica summary record, an originating IPA, and time stamp. A replica summary record contains a network IPA, network IPA mask, and a performance metric. The network IPA and mask collectively identify a group of internet hosts sharing a common IPA prefix. A performance metric indicates a preference when two or more replica routers broadcast the same replica summary record network IPA and network IPA mask, such that, one replica router will be preferred over the other replica routers. A proximate replica router broadcasts a replica advertisement with its proximate IPA as the originating IPA to distal replica routers. A receiving distal replica router associates the originating IPA and the replica advertisement in the replica database of a distal router, for associating the proximate and originating IPA to a network IPA and mask. The distal replica router may subsequently broadcast a new replica advertisement with the distal IPA replica as the

originating IPA to replica routers in a replica router hierarchy, enabling the replica router hierarchy to route and forward a client request through the replica router hierarchy to a preferred replica.

The present invention is distinct from Gifford by broadcasting an originating URL and originating IPA as a routing item. The originating URL identifies the sought-after web content data independent of the web cache or web server from which the web content data may be subsequently retrieved, which is identified by the originating IPA. The receiving distal web cache associates the originating URL to the originating IPA in its forwarding-routing table. A distal web cache rebroadcasts a routing item with the same originating URL and the distal cache IPA as the originating IPA for the purposes of routing and forwarding requests in a network of web caches. The optional distance metric identifies a minimum distance web cache when a plurality of web caches in a network of web caches stores the originating URL web content data.

Gifford does not teach associating an originating IPA with an originating URL, nor the transmission of them as a routing item, nor for the purpose of creating a network of data caches, nor for the benefit of efficient data access. Gifford does broadcast replica advertisement items so that a receiving destination can determine which IPA to go to for requesting web content data.

Hence, Gifford does not teach association of originating IPAs and URLs, nor for a purpose of building a web cache network identified by associated IPAs and URLs.

Isoyama teaches web cache selection based on a multiplicative metric as a cache priority that combines internet network distance as a route length and web server IPA access frequency. The internet network distance measures the number of internet router hops through which an internet routing protocol message transits, from the originating internet router to the proximate internet router. A proximal web cache associates an originating server IPA with an originating cache IPA and a distance metric for the purposes of determining whether the proximal cache should store web content data identified by the URL. Isoyama does not teach associating an originating URL with an originating IPA, nor the transmission of it as a routing item. But Isoyama is used for developing a network of web caches. The present invention broadcasts a routing item for the purposes of determining where web content data identified by the originating URL is stored in a network of web caches.

Brendel teaches associating originating URL resources to originating IPA, in a directory in a load balancer for access to a group of servers, collectively operating as a single web server, for distributing load among the servers. Gifford teaches broadcasting replica advertisement items associating IPA and

advertisement data so that a receiving destination can determine which IPA to go to for requesting the web content data. Isoyama teaches the use of distance metrics for determining when data should be stored by a proximal cache. These are disjointed references teaching differing things that cannot be combined along the lines of the present invention. The cited references do not teach or suggest associating originating URLs with originating IPAs as routing items, nor the transmission broadcast between proximal and distal caches, nor for purposes of forming forwarding-routing tables in the caches, nor for routing URL requests in a network of web caches, for efficient transfer of data. The problem solved and the solution thereto is not taught nor suggested by the cited references. Allowance of the claims is requested.

Respectfully Submitted

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